To U.S. Environmental Protection Agency (EPA)

Subject: San Jacinto River Waste Pits Superfund Site – Comments on Draft Final Interim Feasibility Study, March 2014

Dear Gary,

Thank you for asking the Technical Review Team of Harris County ("Technical Review Team") to review and provide comments on the Draft Final Interim Feasibility Study dated March 2014 ("Draft Final Interim FS") prepared by responsible parties McGinnes Industrial Maintenance Corporation and International Paper Company and their consultant Anchor QEA (RPs) in connection with the San Jacinto River Waste Pits Superfund Site ("SJRWP" or "Site"). These comments will supplement the two sets of comments that the Technical Review Team has already submitted to EPA in connection with the Draft Final Interim FS.

The people of Harris County are directly affected by the dioxin waste at the Site and the Technical Review Team appreciates this opportunity to explain why the remedy for cleaning up the 2,3,7,8-TCDD – referred to by EPA as being considered the most toxic of dioxins – should be the removal of the dioxin waste from the Site. The Technical Review Team believes that the unique circumstances surrounding this Site demonstrate that the removal of the dioxin waste from the partially submerged Site and the San Jacinto River sediments is the only remedy that can effectively and permanently address the continuing potential and actual threat to human health and environment it poses to Harris County.

The Technical Review Team has organized its supplemental comments in the following sections: I. Area and Environment; II. General Comments; III. Specific Comments; and IV. Conclusion.

I. AREA AND ENVIRONMENT

The San Jacinto River is a precious resource to the people of Harris County. It is the major source of fresh water for Galveston Bay. Private homes and parks are located on its banks, and the people have come to recreate in its waters and on its shores for decades. They still do so today, unfortunately at their peril because of the once hidden dioxin wastes at the Site. The River provides a habitat for countless birds, fish and aquatic mammals and as such it attracts both recreational and subsistence fisherman, hunters, boaters and skiers from across the State of Texas and the United States most of whom are unaware of the danger that is hidden beneath the rocks and waves at the confluence of the River and the Interstate 10 East Bridge.

The Site is located in a sensitive marsh, in an underwater and aquatic environment, in submerged sediments, in a major floodplain, in the direct path of a critical floodway, and are subjected to frequent and severe impacts from major hurricanes, storms, tidal action, tropical depressions, flooding and continuing subsidence that are common to this area near the Gulf of Mexico. Because of this, even the interim and short-term "rock pile cap" that EPA had to require to be put into place as part of the Time Critical Removal Action ("TCRA") through the issuance of a Unilateral Administrative Enforcement Order was quickly shown to be unable to withstand the tidal forces and the most routine of storm events, further demonstrating that an in-situ or in-place remedy is not appropriate.

Most compelling of all, and well-documented by EPA, the State of Texas and Harris County, is that the dioxin waste at the Site is in an area of heavy recreational use by the men, women and children of Harris County – including those who continue to subsistence fish near the Site to feed their families and where commercial fisherman have been documented to harvest seafood destined for commercial distribution for public consumption. Various biological screening studies have demonstrated that TCDD is generally resistant to biodegradation, and bioaccumulation in aquatic organisms has been demonstrated. Based upon the unique characteristics of the site, its locale, and the serious threat to the people of Harris County and the sensitive environments of the San Jacinto River and Galveston Bay, the only appropriate remedy to effectively and permanently address the threats to human health and the environment is the removal of the dioxin wastes from the Site.

II. GENERAL COMMENTS

A. Extreme Weather Events, Storms Surges and High-flow Events.

EPA has already documented that the Site where the dioxin contamination is located is prone to extreme weather events, hurricanes, storms, floods and high-flow events that occur at the Site location, including Hurricane Ike in 2008, Tropical Storm Allison in 2001 and the October 1994 Flood, just to name a few of the devastating storms that frequent the tropical climate of the Texas Gulf Coast. EPA's October 18, 2010 letter to the responsible parties advised them that Hurricane Ike had a flow of 63,100 cubic feet per second, Tropical Storm Allison had a flow of 126,000 cubic feet per second, and the October 1994 Flood had a flow of 344,348 cubic feet per second. The proven exposure of the Site to severe flooding and high-flow tidal action would make any remedy that leaves the dioxin contamination in place in the river at risk to the impacts of such severe weather and dangerous tidal conditions. These storms will continue, are predictable and foreseeable, and the highly toxic dioxin material is located directly in the path of the floodplain where the storms surges will race through at great force. Removal and not a cap or containment is the only sure way to defend against the inevitable forces of nature of the strength and magnitude of the hurricanes, tropical storms and floods that occur in this coastal environment. If contaminated material is left in the river, it will continue to negatively affect the important downstream ecological resources of the lower HSC and Galveston Bay that the Houston-Galveston Ares is built on. The aquatic resources will continue to become more and more impacted as the material moves downstream. The only way to insure this will not happen is to remove the contaminated sediments from the Site.

B. Floodplain Issues.

The Site is located in one of the major pathways for floods in Harris County – one of the most frequent types of natural disasters visited upon this Gulf Coast area. Harris County has retained an expert hydrologist who has written a report establishing that there have been 27 major flood events in Harris County since 1965. The idea of trying to construct a cap or other in-place remedy in such a floodplain, which could impact, impair and alter the floodwater pathway routes of the river, and risk structural damage and failure due to severe storm and tidal action, among many other dangers, would not be a responsible or appropriate recommendation. To avoid altering the floodplain and pathway routes of the river, an in-situ remedy should not be implemented in this location. Due to the severity and force of floods and flash floods that hit the coastal area where the Site is located, the risk of breach, damage and tidal forces on treated or capped material or structures would be an unacceptable risk, which could lead to the even more widespread dispersal and transport of the 2,3,7,8-TCDD up and down the river, as well as upon residences and properties in the area impacted by flooding. The only way to insure this will not happen is to remove the contaminated sediments from the Site.

C. Subsidence Issues.

The Responsible Parties and their consultant, Anchor QEA, have drafted numerous technical documents and submittals stating that the Site is located in an area where the lowering and movement of land and sediments from subsidence activities have contributed to the exposure of dioxin into the San Jacinto River. A remedy that contemplates leaving the dioxin in the same area subject to such subsidence would not be protective. Removal of the dioxin waste from areas prone to subsidence would protect against this risk and remove concerns regarding leaving dioxin in place in the water, subsurface and sediment that may be subject to instability concerns of the type raised by the Anchor reports, including subsidence issues they identified in the Draft Final Interim FS. The only way to insure this will not happen is to remove the contaminated sediments from the Site.

D. A removal remedy would be a long-term permanent solution, to which EPA gives preference as a remedy that permanently and significantly reduces the volume, mobility and toxicity of wastes.

A removal remedy is a permanent solution in that the toxic 2,3,7,8-TCDD source material will be eliminated and no longer available as a route of exposure to humans or the environment, either from direct exposure and may ameliorate the ingestion of dioxin-laden seafood from fishing or commercial sale to the public. Removal also reduces all of the volume and any risk of mobility by taking it out of the Site and river sediments entirely. In a location where highly toxic materials in an aquatic environment are regularly subjected to extreme storm events, flooding and tidal forces, removal is the only remedy that can provide assurance of permanence from risk of continued exposure. In addition to eliminating exposure, a permanent removal reduces the volume, risk of mobility and the issue of toxicity altogether.

III. SECTION SPECIFIC COMMENTS

1. (Section 3-3, Applicable or Relevant and Appropriate Requirements): The Texas Surface Water Quality Standard (30 TAC 307.6(d)) was included in Table 3-1, however text in the 'Comment' column states that "the surface water quality criterion for TEQ, expressed as a concentration in edible fish tissue in 30 TAC §307.6 (c) 11, is generally not being met throughout the Houston Ship Channel, San Jacinto Bay and Galveston Bay areas. In more than 90 percent of edible fish tissue samples and in more than 85 percent of edible crab tissue collected by Respondents, TCEQ and TDSHS outside of USEPA's Preliminary Site Perimeter from 2002 through 2011, TEQ concentrations exceeded this tissue-based standard. Therefore, applicability to evaluation of effectiveness is limited due to ambient conditions in the region". The Technical Review Team disagrees with the statement that the standard is not applicable. The HSC and Galveston Bay are downstream of the Site and, therefore, the high levels measured in these water bodies were and are directly affected by the contaminated sediment and water influx from the Site. Modeling conducted by TCEQ as part of the TMDL project showed a dramatic decrease in 2,3,7,8-TCDD concentrations in the San Jacinto River when the high sediment concentrations at the waste pit location were removed. Even when the concentrations in the HSC were elevated, a significant decrease in concentrations in HSC Segment 1005 (from confluence with San Jacinto River to Morgan's Point) was predicted with the Site (segment 1001) sediment removed. Thus emphasizing the site overall influence on contamination in HSC and Upper Galveston Bay[1].

[1] Modeling Report can be found at http://www.tceq.texas.gov/assets/public/implementation/water/tmdl/26hscdioxin/26-dioxinmodelingrpt.pdf

2. (Appendix A: Chemical Fate and Transport Modeling, Section 2-1): Model simulations for the 100-year flood event resulted in net erosion depths between 1 and 10 cm (0.4 to 4 inches) in the vicinity of the Site (as showed in Figure 2-6) and a maximum net erosion of 29 cm (11 inches) as indicated in Table 2-2. However, a Report by the National Transportation Board on the Evaluation of Pipeline Failures during the October 1994 Flooding in the San Jacinto River[2] states that the main area near the I-10 bridge experienced between 10-12 feet of scour, which caused the rupture of 8 pipelines. The Technical Review Team is concerned with the applicability of the sediment transport model since it seems to significantly underpredict scour depths for high flood events. This is particularly important for the proposed alternatives that leave the contaminated sediment in-place because an event of this magnitude would result in resuspension of significant amounts of contaminated sediment in the water column and downstream. The only way to insure this will not happen is to remove the source material and the contaminated sediments from the Site.

3. (Appendix A: Chemical Fate and Transport Modeling, Section 4): The modeling, as performed, yields a finding that the long-term effectiveness of Aleternative 5 and 6 is lower than that for Alternatives 1, 2, and 3. However, the model assumes release rates of 0.85% for Alternative 5aN and 3% for Alternatives 5N and 6N. When removing up to 200,100 cy of sediment, this results in unrealistically high releases of dioxins, hence, misrepresenting the long-term effectiveness of removal of contaminated sediment to the system. Removal of the dioxin material can be accomplished in a protective manner through a variety of construction techniques successfully used in contaminated sediment and other aquatic sites across the country. This is particularly true in the San Jacinto River location because of the shallow water depths. Berms or sheetpiles can be used to isolate an area being excavated from the river, as well as construction of temporary earth/rock berms, or other engineering controls, around excavation areas. Assumptions of dioxin release rates are not appropriate considering overall good construction practices.

Furthermore, the model does not simulate any scenarios in which the armored CAP alternatives may result in sediment releases (i.e., high flow events). The Technical Review Team identified a critical gap in the Draft Final Interim FS in that it fails to adequately address the risks of one of the greatest threats to leaving the dioxin contamination in the river, through severe and violent storms, hurricanes, floods and tidal influences that have and will continue to be a threat to the integrity of any in-place remedy. This is one of the central issues to evaluating an in-place remedy of principal threat wastes in an aquatic environment of the Gulf Coast which is subject to well-documented, major storm events, some of which are devastating in their violence and severity. As recently as 2008, Hurricane Ike struck the Texas coast and was so large that it caused devastation all the way from the Louisiana coastline through the coastal areas of Texas almost to Corpus Christi. In 2001, Tropical Storm Allison devastated southeast Texas, developing a tropical wave in the Gulf of Mexican that struck the upper Texas Coast and flooding Harris County. In 1994, remnants of Hurricane Rosa stalled over Texas to create the October Flood of 1994, which caused widespread and record flooding of Texas rivers and reservoirs, including impacts to the San Jacinto River. In 20 years time, three major storms have caused significant flooding and damage in the region. These types of storms are foreseeable, predictable and will continue to occur. It is also not known how much of the dioxin material from the San Jacinto pits could have been or was washed into Galveston Bay and other river systems as a result of the effect of these storms on the Site. The only way to ensure that significant risks do not occur again is to remove the material from the threat caused by such storms.

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[2] National Transportation Safety Board, 1996. Evaluation of Pipeline Failures during Flooding and of Spill Response Actions, San Jacinto River near Houston, Texas, October 1994. Pipeline Special Investigation Report, NTSB/SJR-96/04. Washington, DC. Adopted September 6, 1996.

4. (ES, Comparative Evaluation of Alternatives for Area North of I-10): Capping even on an interim, temporary basis has already proven to be problematic in an area with such severe tidal and storm action. EPA has already documented failure issues with the interim western cap and had to order the responsible parties to reassess their temporary cap to include consideration of the impact of waves, and documenting bulging and structural stability issues among other things.[3] The Agency was clear that "[i]t is the EPA's position that the observations listed above have increased potential threats to human health and the environment."[4] A capping remedy that leaves dioxin contamination in the San Jacinto River – an area of subsidence, severe storm action, flooding, and tidal and wave influence -- is not appropriate at this Site. This is particularly true when removal of such source and principal threat material is an obvious, proven and most protective way to remove the contamination from the River and ensure that it does not continue to risk exposure to humans, the seafood they are consuming and the environment.

5. (Section 4.1.5) of the FS points out that "dredging-related releases occur, they reduce the overall effectiveness of a dredging remedy …" and that this should be considered in comparison of non-dredging alternatives. However, the report never discuss the substantial ecological or human health benefits of removing anywhere from 52,000 – 200,100 cy of highly contaminated dioxin sediments. Removal of this volume of contaminated sediments would greatly reduce the risk to future aquatic resources and fisheries as well as to the possible reduction of human health related issues. In addition, once it is removed, it will not continue to be distributed downstream to impact additional resources in the HSC and Galveston Bay areas. There would be a significant long term benefit to removal of this volume of highly contaminated dioxin sediments. Simply stating that this material will be buried by upstream "clean" sediment and not released in the future due to frequent and strong storms, is short-sighted, naïve and unrealistic. Storms will continue to move this material downstream to contaminate other areas and will then be placed on top of existing sediments, making it bioavailable to the food chain.

RPs have already admitted in previous submissions to EPA that using the 100 year storm event standard for contaminated sediments for the construction of the TCRA would not necessarily address the risk to human health and the environment posed by the site and that the dioxin in the Site are principal threat wastes for which treatment of the waste is preferred.[5] Furthermore, the PRPs' calculations indicated that the percentage risk of failure of the TCRA in the long term was too high for the TCRA to be considered a viable long term remedial option.[6]

6. Table 4-2 presents a summary of case studies on releases from dredge projects. Four of the projects listed were **pilot studies** done from 1995 to 2005; one was an "early action" and the last was Phase 1 of the Hudson River project. Although pilot studies provide valuable data for use in final design and implementation, the results are not indicative of full-scale performance because they do not optimize the tools and methods of operation. Likewise, there is no time for optimization in an early action or in early phases of projects. The pilot studies show the performance of the tools and methods used, but do not show what can be accomplished with optimization during full-scale implementation. None of the listed projects used solid barriers such as earth berms or sheet piles.

[3] See EPA July 31, 2012 letter to David Keith at Anchor QEA regarding TCRA Cap Repair.

[4] EPA July 31, 2012 letter to David Keith at Anchor QEA regarding TCRA Cap Repair.

[5] October 18, 2010, Final Decision – Dispute Resolution Regarding EPA's Decision for a Temporary Cover Designed for a Storm Event with a Return Period of 100 Years to Address the Time Critical Removal Action, p. 4.

[6] *Id.*

7. In Section 4.1.5, the FS states that case studies have shown that barrier such as sheetpile walls have limited effectiveness. Properly designed and installed barriers such as sheet piles and earth berms are effective in containing suspended sediment. The joints between sheet piles can be sealed to essentially eliminate water flow. In addition, the water level inside the sheet piles could be lowered to provide additional hydraulic control to prevent release of suspended or dissolved contaminants. The barriers should be installed outside the area of elevated contamination; therefore, suspension of sediment during pile removal would not result in release of contaminants. If local scour is a concern adjacent to the sheetpile, erosion controls can be installed to limit erosion.

8. In Section 4.1.6, the FS states that there is limited upland area available for sediment transport. This is not a significant constraint because the sediment can be processed in a relatively small area. For example, in Alternative 5aN, 137,600 cy would be removed in a project with a duration of 19 months. Dredging at a rate of 500 cy per day would require 275 work days to complete dredging, which fits in the overall project schedule. Dredged sediment would be processed and transported from the upland site at the same rate as it was dredged; therefore, an area of only a few acres would be needed.

9. In Section 4.3.6, the FS states that the width of an earthen berm is limited by the reach of an excavator. The berm width and height is not limited by the reach of an excavator. Wider and higher earth berms could easily be constructed by working from both sides or with the use of clamshell buckets on cranes that have much longer reach than excavators.

10. In Section 4.3.6, the FS states that the presence of an armored cap and shallow water pose significant implementability challenges for sheetpile. The existing rock armor can easily be removed along the sheet pile alignment, so that is not an issue. As noted above, earthen berms can be higher and constructed in deeper water. In addition, barges with cranes can operate in water depths of 2 to 3 feet; so shallow water is not an issue.

11. In Section 5.1.6.2, the FS states that additional evaluations are necessary to evaluate compliance of dredging with the Clean Water Act and other ARARs. However, as noted in Section 4 of the FS, dredging is commonly selected as the remedy for sediment remediation. Compliance the CWA and other ARARs is generally less of an issue for dredging than for capping because dredging does not result in a net fill within the water body. As noted above, flooding is a regular occurrence at this site. Placing cap materials reduces the water depth, which has a negative impact on flood storage and the flow capacity of the river channel. There are a number of laws and regulations on placing fill materials in waterways, which make compliance with ARARs more difficult for capping alternatives than for dredging alternatives.

12. In Section 5.1.6.3, the FS assumed that the post-dredge residual concentrations would be the similar to the material removed. The post-dredge residual concentrations would be lower if the dredging was done in multiple layers. One common method of estimating post-dredge concentration is to assume that the concentration in the residual material is equal to the average concentration of the last layer dredged. Therefore, by dredging in layers, the residual concentration would be lower.

13. Section 5.1.6.3. The predicted post-dredge sediment concentrations are based on **assumed** release of contaminants. As noted above, the release of suspended and dissolved contaminates outside the berms and sheet piles can be eliminated with proper design and construction methods.

14. Section 5.1.6.5. The temporary berms and sheet pile can be built to higher elevation to eliminate over-topping during storm events.

15. Section 5.1.6.5. See above comments on the **assumed** release rate of 0.85 percent.

Additional issues that will need to be addressed include issues associated with the groundwater detection limits and the PCB assessment. It appears that the detection limits for groundwater samples that are used to support the Responsible Parties' conclusion that no groundwater impacts exist were too high. It appears that the detection level for 2,3,7,8-TCDD was 100 times higher than the State water quality standard for TEQ (which includes other congeners in addition to 2,3,7,8-TCDD). This indicates that the detection level the Responsible Parties used would not allow them to conclude if dioxin levels were in the groundwater or constituted a potential threat. Another issue is that the PCB assessment was completed based on Aroclor analyses, not a high-resolution congener-specific method. This is problematic because individual congeners are needed for the risk assessment.

IV. CONCLUSION

The Technical Review Team believes that the unique circumstances surrounding this Site demonstrate that the removal of the dioxin waste from the partially submerged Site and the San Jacinto River sediments is the only remedy that can effectively and permanently address the continuing potential and actual threat to human health and environment it poses to Harris County.